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AN ANALYSIS OF NATIVE MORTALITY IN CANADA

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ABSTRACT

In 1986, Indian and Northern Affairs Canada published a series of reports entitled, "Overview of Registered Indian Conditions in Canada." The report contained many cross-tabulations concerning the health and socioeconomic conditions of Canada's Natives. Because the Registered Indian mortality data contained in these reports were the most recent and comprehensive data available in the public domain, they were reanalyzed to allow for a comparison of the Native and general Canadian population's mortality experience for 1980-1982, and to develop three hypotheses to explain the disparate mortality experience of the two populations: 1) the minority status hypothesis, 2) the modernization/disruption hypothesis, and 3) the subcultural hypothesis. It is suggested that in future research a multivariate statistical analysis should be employed to test the above three hypotheses to get beyond the purely descriptive analysis pursued here.

1. Introduction

Although there is unequivocal evidence that Natives suffer elevated mortality rates in comparison to the general Canadian population (e.g., Jarvis and Bolt 1980, Millar 1982, Trovato 1988), the literature does not provide much substantive etiological insight into this differential. Our aim is to present a descriptive overview of mortality conditions among Natives, using data contained within a recent report, "Overview of Registered Indian Conditions in Canada" and to develop a number of substantive hypotheses for future investigation into this phenomenon.

2. Descriptive Overview

Before proceeding with the descriptive overview, it is important to point out that the data used for this analysis contain some limitations. Although the information in the "Report" is very useful and is, indeed, some of the most comprehensive and recent data available in the public domain, the fact that the cause of death data are not age-sex standardized is problematic. Nevertheless, we are convinced that if standardization were possible, the mortality discrepancy between Natives and the rest of Canada would not disappear, but would most likely widen. The general literature substantiates this point (see for example, Jarvis and Boldt, 1980).

The following is a brief synopsis of the data used in this study. The data for the registered Indian population, (that is, "a person who pursuant to [the Indian] Act is registered as an Indian or is entitled to be registered as an Indian" [Lithwick, et.al., 1986:84]) were obtained from a series of reports entitled, "Overview of Registered Indian Conditions in Canada" (Indian and Northern Affairs Canada, 1986)[1]. In total, eight reports were used in this analysis, consisting of: Newfoundland, New Brunswick and Prince Edward Island, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia. Data from the Atlantic provinces were collapsed due to insufficient numbers under the general heading of "Atlantic Region." Unfortunately, the Yukon and Northwest Territories are omitted from this analysis due to the prevalence of very small numbers. The data, therefore, are presented for seven provincial regions: Atlantic, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia.

The registered Indian data in the reports were taken from Indian and Northern Affairs Canada's customized data base from the 1981 Census of Canada and on registered Indian mortality data from Health and Welfare Canada. Data for the total Canadian population are also from the 1981 Census of Canada and from Vital Statistics.

The terms "total Canadian population," "general population" and "reference population" always refer to

either the total Canadian or provincial population, as specified, minus registered Indians.

Table 1 shows the average death rate per 100,000 population for registered Indians and the total Canadian population, as well as the standard deviations. As mentioned earlier, the data are not standardized for age and sex composition in this table. Registered Indians present an average death rate of 25.7 deaths per 100,000 population with a standard deviation of 38.2. The reference population shows an average death rate of 30.6 deaths per 100,000 population with a standard deviation of 73.3. The registered Indians' lower standard deviation indicates that the Indian death rate is more concentrated around the mean. The higher standard deviation of the reference population indicates a greater variability in death rates. The difference in means between the two populations is misleading because the two populations have very different age structures.

The age structure of a population has a dramatic effect on mortality. That is, we would expect to find a higher crude death rate in an aging population because a larger segment of the population is elderly. Age-specific death rates, if they were available, would provide us with a completely different picture since it is known that older populations demonstrate different age-specific death rates than relatively young ones. In Canada, sixty-four percent

TABLE 1

Average Death Rates per 100,000 Population for Registered Indians and the Total Canadian Population 1982

	Average Death Rate	Standard Deviation
Total Canadian Population*	27.35	52.58
Registered Indian Population*	25.71	38.23
Total Population	30.62	73.34

* excepting Registered Indians

** death rates for the Registered Indian population is a weighted average for two time periods, 1980 and 1982.

Source: Lithwick et al., (1986).

of the Indian population in contrast to 42 percent of the reference population, are under the age of 25 years. Clearly, our Native population would be considered young and this alone has a dramatic effect in producing an apparent lower average mortality level.

Table 2 compares cause-specific death rates by ethnicity. As shown, registered Indians experience higher death rates than the reference population in both accidents-violence and ill-defined and other categories. Their accidents-violence death rate is over three times as high as the reference population's. Registered Indians experience a 20 percent higher risk of death due to ill-defined and other causes.

Table 3 shows the average provincial death rates for registered Indians and the reference populations. The lowest average death rate for registered Indians is in Manitoba and the highest in Alberta. Registered Indians have an advantage over others in Canada with respect to provincial death rates in all cases except Alberta and Ontario. In Manitoba, registered Indians enjoy an average death rate differential, in relation to the reference population, of .58, while in Alberta they are disadvantaged by a ratio of 1.29.

Table 4 shows provincial cause-specific death rates for both Indian and non-Indian populations. The highest

TABLE 2
Cause of Death by Ethnicity for Canada per 100,000 Population*

Cause of Death	Registered Indian	Reference Population	Ratio of Registered Indian Death Rates to Reference Population
ACCIDENTS-VIOLENCE:			
Motor Vehicle	54.9	19.4	2.83
Drowning	21.6	2.2	9.68
Exposure	9.6	1.1	8.72
Fire	21.4	2.8	7.79
Falls	9.7	7.8	1.24
Firearms	20.2	7.2	2.82
Overdoses	12.8	6.9	1.84
Other	56.8	15.9	3.57
TOTAL	206.9	63.3	3.27
Average	25.9	7.9	
DEGENERATIVE DISEASES:			
Neoplasms	64.7	174.6	.37
Endocrine, nutritional and metabolic diseases and immunity disorders	13.8	17.1	.81
Blood and blood-forming organs	.9	2.6	.32
Nervous system and sense organs	5.4	10.0	.54
Circulatory system	162.6	334.1	.49
TOTAL	247.3	538.4	.46
Average	49.5	107.7	
ILL DEFINED AND OTHER:			
Infectious and parasitic	13.4	3.8	3.49
Mental disorders	8.4	6.6	1.27
Respiratory system	44.2	56.0	.79
Digestive system	38.4	30.1	1.27
Genito-urinary system	8.5	10.2	.84
Complications of pregnancy, childbirth and the puerperium	.3	0.0	.31
Skin and subcutaneous tissue	.4	.6	.69
Musculoskeletal system and connective tissue	1.1	2.6	.40
Congenital anomalies	12.9	6.3	2.04
Certain conditions originating in the prenatal period	14.1	6.4	2.2
Symptoms, signs and ill-defined conditions	21.1	10.4	2.03
TOTAL	162.9	135.2	1.22
Average	14.8	12.1	
TOTAL OVERALL AVERAGE	205.7	244.97	.84

* Source: Lithwick et al., (1986).

TABLE 3

Average Death Rate Per 100,000 Population by Ethnicity and Province*

Province	Registered Indian	Reference Population	Ratio of Registered Indian Death Rates to Reference Population
Atlantic Region	22.31	32.59	.68
Quebec	24.69	27.96	.88
Ontario	31.40	30.52	1.03
Manitoba	19.78	34.19	.58
Saskatchewan	24.64	34.90	.71
Albaerta	30.08	23.28	1.29
British Columbia	27.09	30.91	.88
Overall Average	25.71	30.62	.84

* Figures based on crude death rates.

Source: Lithwick et al., (1986).

TABLE 4

Death Rate by Cause of Death by Ethnicity by Province*

Province	Accidents-Violence			Degenerative Diseases			Ill-defined and Other		
	Registered Indian	Reference Population	NI Ratio RP	Registered Indian	Reference Population	NI Ratio RP	Registered Indian	Reference Population	NI Ratio RP
Atlantic	17.5	7.3	2.39	61.6	117.7	.52	8.7	11.9	.73
Quebec	17.3	5.4	3.20	57.1	101.4	.56	15.5	10.5	1.47
Ontario	24.2	5.2	4.65	73.0	112.2	.65	18.3	11.2	1.63
Manitoba	10.2	6.3	1.62	37.7	121.4	.31	18.0	14.1	1.28
Saskatchewan	26.1	8.4	3.11	38.0	119.5	.32	18.2	15.1	1.21
Alberta	34.1	7.0	4.87	37.9	75.7	.50	24.5	10.9	2.25
British Columbia	20.9	7.9	2.65	40.8	105.8	.39	25.0	13.1	1.91

* based on crude death rates.

Source: Lithwick et al., (1986).

occurence of accidents-violence deaths[2] for registered Indians takes place in Alberta at a rate of 34.1 per 100,000 population. The lowest incidence of accidents-violence deaths for registered Indians occurs in Manitoba (10.2 per 100,000).

Registered Indians experience relatively fewer deaths due to degenerative diseases than the reference population in all provinces. Although the reasons for this are not evident in the data, the lower rates are a function of a) the young age structure of the Native population, and b) their lower life expectancy. That is, young populations, at the risk of sounding tautological, have lower life expectancies than aging ones and, therefore, tend not to be at risk with respect to degenerative diseases since these are associated with advanced age. In other words, the lower life expectancy of Natives results in their experiencing lower rates of degenerative diseases vis-a-vis the general Canadian population.

The highest incidence of Indian degenerative deaths occurs in Ontario at a rate of 73 per 100,000 population and the lowest is in Manitoba, where the rate is 37.7 per 100,000. The least favourable province for registered Indians in this category is Ontario where the ratio of Indian death rates to the reference population's is .65:1. The most favourable province for registered Indians in this regard is Manitoba, where they enjoy a ratio of .31:1.

Ill-defined and other causes of death occur at the highest rate for Indians living in British Columbia (25.0 per 100,000), followed closely by Alberta (24.5 per 100,000). The lowest incidence of this cause of death for the Indian population occurs in the Atlantic Region at a rate of 8.7 per 100,000.

Indians experience a disadvantage in ill-defined and other causes of death when compared to the reference population in every province except the Atlantic Region. The highest ratio of Indian to reference population death rates in this category occurs in Alberta at 2.25:1. The lowest ratio, in favour of the Indian population, occurs in the Atlantic Region at .73:1.

It is interesting to note that the Native mortality data indicate some curious regional disparities. That is, as one goes from east to west, with the exception of British Columbia, Native mortality rates tend to increase. This raises some important questions for future investigation. Perhaps these disparities are due, for example, to differing Native age-sex structures across regions, or to provincial differences in Native socioeconomic status, or to differences in Native health care practices, or access to provincial health care.

In view of the fact that the above descriptive analysis is somewhat limited, failing to take into account the different age and sex structures of the two populations, a

more rigorous examination using statistical procedures should be employed to investigate Canadian Native mortality. With this in mind, we propose three hypotheses for future inquiry.

Further investigation should consider three aspects pertaining to the mortality experience of Canadian registered Indians: First, the relationship between their socio-economic conditions and mortality; second, the way in which modernization conditions Native mortality; and finally, the role of subculture as a causal factor in Indian death rates, both general and cause-specific.

Native Indians in North America, like the populations of developing nations, are in the process of becoming modernized (Broudy and May 1983; Graves 1967; Hackenberg and Gallagher 1972; Kunitz 1981; Levy and Kunitz 1971; Stull 1972; Trovato 1987). According to the demographic and epidemiologic transition models (Omran 1971; Weeks 1981), Native Indians are progressing through the stages of development characterized by societies that have changed from traditional agrarian to urban industrial (Broudy and May 1983). During this transition, fertility declines to an all time low as societies adjust to lower mortality, economic development, and the greater likelihood of having children survive to maturity (Weeks 1981:37-38). Moreover, as societies become increasingly modern, the major etiological factors of mortality change from predominantly

infectious and parasitic diseases to degenerative and man-made causes (Omran 1971). Thus, the characteristics of the third and final stage of the demographic and epidemiologic transition models are low fertility and mortality rates, and a dominant mortality pattern of degenerative and man-made causes, such as neoplasms, cardiovascular illnesses and accidents and violence.

The mortality and fertility levels, and other general social patterns of Canadian Indians, suggest they are undergoing the transition between the second and third stages of demographic evolution (Romaniuc 1974; 1981; Trovato 1987). Indian mortality rates have declined dramatically within the last thirty years, placing them within the expected range of the final stage of demographic transition (Trovato 1987). Fertility rates have also declined in the last three decades, but they remain at unusually high levels (Romaniuc 1981; 1974; Trovato 1987). Current Native mortality and fertility rates indicate that Natives are in the transitional stage of development. That is, the decline in the birth rate lags behind the decline in the death rate as a population adjusts to its lower mortality (Weeks 1981:37).

The etiological pattern of Native mortality places them in the transitional stage of the epidemiologic transition model. Indians still experience high rates of mortality

due to infectious and parasitic diseases. But, they deviate from the expectations of the epidemiologic model by displaying a much higher rate of accident-violent deaths than would be expected in a less developed transitional population. In fact, their high levels of accidents-violence mortality may even be considered atypical of an advanced population (Broudy and May 1983; Trovato 1987).

A review of the literature concerning this aspect of Native Indians in both Canada and the United States suggests that their minority status plays a dominant role in their mortality pattern. Natives occupy the lowest strata of the larger society's socioeconomic hierarchy, and their mortality levels, especially with respect to accidents and violence, are largely the result of their disadvantaged socio-economic position (Bienvenue 1985; Trovato 1987). Indians, in other words, reflect, in response to their subordinate status, a style of dying that corresponds to their unique and underprivileged style of living (Broudy and May 1983; Jarvis and Boldt 1980; Levy and Kunitz 1971).

Studies focusing on the minority status of Indians have established relationships between general mortality levels and high levels of poverty, unemployment and underemployment, poor housing conditions, inadequate access

to medical services, isolation, low levels of education and occupational skills, and discrimination in the labour market (Bienvenue 1985; Jarvis and Boldt 1980; Kunitz 1981; Siggner 1986; Simpson and Yinger 1985; Trovato 1988). Other studies have attempted to explain the disparate incidence of social pathologies (i.e., deaths due to accidents and violence) vis-a-vis the general population, from the point of view of prejudice and discrimination, rapid social change, subcultural adaptation and acculturation (Broudy and May 1983; Graves 1967; Hackenberg and Gallagher 1972; Kunitz 1981; Levy and Kunitz 1971; Simpson and Yinger 1985; Stull 1972).

A difficulty inherent in most of these studies is that the explanatory concepts and variables tend to be highly interrelated so that it is difficult to isolate the independent effects which determine Native Indian mortality. One reason for this problem lies in the fact that few studies have relied on multivariate statistical procedures. It is suggested, therefore, that multivariate analysis should be undertaken in future studies to compare the mortality of Indians and the general Canadian population with respect to the following dimensions:

1. the minority status of registered Indians in Canada and the impact of that status on their general level of mortality;

2. the effect of modernization on registered Indians in Canada on their general and cause-specific level of mortality; and
3. sub-cultural adaptations as a response to the external pressures (i.e., economic, technological, etc.) of the dominant society.

The following is an elaboration of these three explanations.

3. Hypotheses

Minority Status Hypothesis

Minority status is defined as the subordination of peoples who have special physical or cultural traits that are held in low esteem by the dominant population. Members of minority groups share the same special disabilities that come with their inherited status (Simpson and Yinger 1985:12). Canadian Indians are a subordinate group of peoples who share common socio-economic disabilities. They are the most socio-economically disadvantaged group in Canada (Bienvenue 1985; Siggner 1986; Trovato 1987). As a result, they suffer greater risks of premature death and experience lower life expectancies than the rest of the Canadian population (Trovato 1987). Their differential mortality can be explained largely by their differential access to economic opportunities (Trovato 1987), which, in turn, can be explained partially by their below average

educational attainment, discrimination in the labour market, lack of occupational preparation and geographic isolation (Anderson and Frideres 1981; Bienvenue 1985). In many ways, the overall health condition of Native people is largely a reflection of their subordinate status in Canadian society, which began with the process of European colonization (Bienvenue 1985; Lieberson 1961).

The colonial process led to the creation of reserves to contain Indian tribes while freeing land for settlers (Bienvenue 1985). According to Anderson and Frideres (1981:250), reserves keep Native people from "participating in the political and economic processes within the [dominant] social system ... by preventing [them] from acquiring the skills and knowledge that could facilitate participation in the larger society." Indians, as wards of the government, are subject to special legislation. Therefore, it has been difficult for them to take concerted initiatives to improve their socio-economic position (Bienvenue 1985; Penner 1983:14).

It has been argued that the Indian Act "circumscribes activities in all sectors of Indian communities" (Penner 1983:17) and, in effect, operates to reinforce Indian poverty and dependence (Penner 1983:40). Consequently, the rate of economic growth and job creation programs on reserves are not adequate enough to meet the needs of the Indian population (Bienvenue 1985). Rural unemployment,

which generally ranges from forty to sixty percent (Bienvenue 1985), is as high as ninety percent in some places (Jarvis and Boldt 1980).

Inadequate housing, lack of safety provisions and inferior health conditions on reserves contributes to Natives experiencing the highest morbidity and infant mortality rates in the country (Bienvenue 1985; Jarvis and Boldt 1980). Natives living in isolated communities do not have easy access to medical aid, which makes them "more vulnerable than most Canadians when illness or accidents occur" (Jarvis and Boldt 1980). Harsh winter conditions have contributed significantly to a large number of Native deaths in isolated communities, which could have been prevented if access to medical care were more readily available (Jarvis and Boldt 1980).

The minority status of Native Indians has left them socially and economically disadvantaged. Their special Indian identity has left them both politically and economically dependent. This unique status has given Native Indians a distinct disadvantage on all indicators of socio-economic status, which is reflected in their disparate mortality levels vis-a-vis the general Canadian population.

In further analysis, we would expect to find that registered Indians will exhibit a higher general mortality level than the Canadian population due to their lower

socio-economic status as measured by such economic indicators as income and unemployment levels.

Modernization/Disruption Hypothesis

Native peoples are undergoing numerous social, psychological, economic and political changes as a result of pressures from the dominant society. Acculturation pressures have, more or less, forced the transition of the Native way of life from a traditional to a modern one. That is, among other things, modernization entails the transition from a religious to secular world view; from a subsistence economy to participation in a labour force based on the world economic market and an increasing division of labour; from a dependency on oral history as a means of cultural transmission to a dependency on literacy; from rural to urban life; and from traditional to rational-legal authority (Abercrombie, Hill and Turner 1986:138).

The modernization process affects both Indian individuals and communities in a number of adverse ways. Indian communities are finding their traditional economies replaced by an increasing dependence on wage labour and government transfer payments (Bienvenue 1985; Stull 1972). Traditional villages find it difficult, with the depletion of their resources and increases in population, to provide for the subsistence needs of their members (Hackenberg and

Gallagher 1972). Consequently, large numbers of younger members leave their home villages in search of employment. Large-scale emigration of young members causes stress for both the remaining members of the home village as well as the emigrating individuals (Hackenberg and Gallagher 1972). The loss of a large proportion of the young population causes social disruption in the home village. Kinship obligations, such as taking care of elderly family members, cannot be fulfilled by younger family members who have left the reserve in search of employment. Moreover, those who remain in the village feel the future of their community threatened since new generations are not replacing the old.

Individuals who leave their traditional communities encounter high levels of stress upon entering modern urban centres. Their traditional Indian upbringing does not prepare them for the different lifestyle that comes with urban living. The norms and expectations of the new community are incongruent with those of their original communities. The incompatibility between the norms, expectations and behaviour of the Indian immigrant and the demands of the urban environment cause them to experience high levels of stress, and, consequently, low degrees of adjustment to city life (Graves 1967; Hackenberg and Gallagher 1972; Stull 1972).

The socially disruptive effects of modernization in the Indian village and the stress-inducing effect of modernization on the Native individual has been correlated with a high incidence of accidents-violence deaths. Stull (1972) and Hackenberg and Gallagher (1972) have found that the high incidence of accidents-violence deaths among the Papago Indians is directly related to the high levels of stress they experience under the increasing pressures of modernization. Graves (1967) argues that strong acculturation pressures destroy the means to attain traditional goals. Indian individuals are left with feelings of intense alienation and relative deprivation. The problem, he states, is that Native people are encouraged to take part in the dominant economic system, and to strive for the system's economic goals, but they are not provided with, nor well-suited for adequate economic access to those goals. Frustrated attempts to achieve these goals leads to means-goal disjunction, which is likely to produce high rates of problem behaviour, such as heavy drinking and drunkenness (Graves 1967).

The stresses of modernization appear to be most profound in the more modern or urbanized Native communities (Hackenberg and Gallagher 1972; Stull 1972). Accident and injury rates, which have been used as an index of stress[3] have been shown to be positively related to the level of modernization attained by Native villages (Hackenberg and

Gallagher 1972; Stull 1972). That is, the more urban as opposed to isolated rural the village is, the higher the level of accidents-violence mortality. Therefore, we would expect to find a higher level of general mortality among the more urban segment of the Native population in relation to the less urban (or rural) sectors. We would also expect to find a higher incidence of accidents-violence deaths as the population becomes less isolated geographically, due to their increasing proximity to urban centres and the corresponding modernization pressures.

Sub-Cultural Hypothesis

Ethnicity is an important predictor of general and cause-specific mortality (Trovato 1987). Cultural differences in norms, values and social controls on lifestyles may have significant explanatory power for Native mortality beyond the effect of socio-economic and demographic variables (Broudy and May 1983; Graves 1967; Kunitz 1981; Levy and Kunitz 1971; Trovato 1987). Of particular importance is the role alcohol plays as a dominant part of Indian culture, in relation to the level of accidents-violence deaths. Accidents-violence mortality is closely linked to the problem of alcohol use in Indian communities (Broudy and May 1983; Hackenberg and Gallagher 1972; Jarvis and Boldt 1980; Kunitz 1981; Millar 1982; Stull 1972; Trovato 1987).

It has been argued that former hunting and gathering societies were characterized as having loose organizational structures and weak social controls. This type of culture "would be expected to give rise to independence of thought and action and to a reluctance to intervene in the lives of others" (Graves 1967). In other words, cultural groups displaying these characteristics lack the necessary social and psychological controls that would inhibit expressive and impulsive behaviour. Under strong acculturation pressures, individuals from these groups are more likely than others to engage in excessive drinking and social-problem behaviour (Graves 1967).

Levy and Kunitz (1971) argue that, among the Navajo, drinking is a means to achieving socially-valued goals. Excessive alcohol consumption is perceived as a means for achieving power, which is compatible with the values of semi-nomadic groups. Further, they add:

> peer-group drinking is a typical phenomenon for unacculturated, on-reservation Navajos and that it is transported off-reservation when these individuals migrate for part-time or full-time work. Clearly this is deviant behavior by the criteria of off-reservation observers, but it is not clear that it is deviant on-reservation.

Under the pressures of acculturation, tribal peoples have had to adapt to their changing environment. Drinking serves as a functionally adaptive mechanism for Natives which enables them to cope with the external pressures of

modernization. The Navajo pattern of peer-group drinking functions as a mechanism for social integration by allowing members to gain a sense of social solidarity. Activities, such as story-telling and singing drinking songs, establish continuity with the old culture. Sharing alcohol with others fosters and maintains social status for the individual. Isolate drinkers are considered deviant by the Indian community (Levy and Kunitz 1971).

Drinking also has another function in the context of Native sub-culture. Drinking helps individuals to overcome inhibitions, enables them to become better speakers, helps to facilitate assertiveness and aggressiveness, and strengthens a person's self-image. Alcohol allows young individuals to display certain skills that are highly valued by Native culture. Skills of luck and daring are central to young adult members of hunting and gathering groups (Levy and Kunitz 1971)[4].

Levy and Kunitz (1974) conclude that Navajo drinking patterns are a reflection of the group's reaction to the external pressures of the dominant society. Indian community responses "are determined by their own culture and values ... they deal with external stresses in culturally patterned ways." Unfortunately, the social conditions of Native life are changing rapidly. With the acquisition of modern items, such as motor vehicles and firearms, cultural values and social controls involving

safety practices are slow to be adopted (Broudy and May 1983). Consequently, the excessive use of alcohol coupled with the use of modern items that require safety knowledge, leads to a high incidence of accidents-violence mortality. We would predict, therefore, that registered Indians, due to their unique cultural milieu, would experience a higher general level of mortality than the Canadian population, and that these differences would be most pronounced in the case of accidents-violence deaths.

4. Conclusion

The mortality experience of Natives in Canada is one of grave concern for both non-Natives and Natives alike. It is a situation which, if left unaddressed, can have serious consequences for the future of our Native peoples. It is hoped that this paper will have provided impetus for further empirical research. The three hypotheses elaborated here should prove useful, but need to be verified with multivariate statistical techniques.

FOOTNOTES

1. The "Overview of Registered Indian Conditions in Canada" consists of a series of provincial reports written by the following:

   Hugh Lautard - New Brunswick, Prince Edward Island and Nova Scotia
   Jeremy Hull - Quebec and Manitoba
   Katherine Graham - Ontario
   George Jarvis - Saskatchewan and Alberta
   Katie Cook - British Columbia

2. The accidents-violence cause of death category consists of all deaths of an accidental, violent or self-inflicted nature. Subsumed under this category are deaths due to suicide (Appendix A shows age-specific suicide rates for Natives and the total Canadian Population). The data do not distinguish between accidental and self-inflicted deaths. For example, under the class "firearms," we can assume that some of these deaths were accidental and some self-inflicted. However, the data from the reports are presented in such a way that it is impossible to determine what proportion of firearm deaths are accidental and self-inflicted.

3. With regard to accidents as an indicator of stress, Hackenberg and Gallagher (1972) put forward the following argument: "The study of accidental injury recommends itself for an assessment of the relationship of culture change to health status. Accidents require no biological agent, are not restricted to a particular population component (age-sex, occupational or genetic), and are not specific to a particular environment. Accidents offer free play to those variables which may be considered stressful, even though precise definitions of the concept "stress" continue to be elusive. Finally, since accidental injuries and deaths are much more frequent than the morbidity factors usually studied under conditions of rapid culture change (for example, coronary heart disease, malignant neoplasms, essential hypertension), a larger statistical run of cases may be secured with greater opportunity for cross-classification by test variables."

4. Levy and Kunitz (1971) have found that among Navajo males who had drunk heavily in their younger years, all had either stopped drinking completely or had decreased their intake considerably upon reaching middle age.

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APPENDIX A

Age-Specific Suicide Rates for Registered Indians and the Total Canadian Population Per 100,000 in 1982*

Age Group	Registered Indians	Total Canadian Population
0 - 9	----	0.3
10 - 14	----	1.4
15 - 19	93.4	12.6
20 - 24	104.0	19.1
25 - 29	80.9	20.5
30 - 34	60.0	18.1
35 - 39	28.0	17.3
40 - 44	8.9	18.4
45 - 49	22.0	20.6
50 - 54	----	22.1
55 - 59	33.1	22.3
60 - 64	----	17.5
65 - 69	27.0	17.5
70 - 74	33.1	18.9
75 - 79	----	14.0
80+	----	11.1
TOTAL	38.9	14.3

* Data taken from Lithwick et al. (1986).

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